

REMARKS

Claims 6, 8, 20-21, and 25-29 have been cancelled. Claims 4 and 5 have been amended. Claim 30 has been added. Claims 1, 4-5, 7, 9-14, 15-20, 22, 25, and 30 are currently pending.

On page 2 of the Office Action, claim 8 was objected to under 37 C.F.R. § 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. In particular, the Examiner alleged that claim 8 recites only limitations that appear in claim 1 and does not further limit claim 1.

Applicants have cancelled claim 8, thereby rendering the objection moot.

Claims 4-9 were objected to due to various informalities. In particular, the Examiner alleged that the claims currently appear to recite a plurality of the same element.

Applicants have amended claim 4. Withdrawal of the objections is respectfully requested. As claims 6 and 8 have been cancelled, the rejection is moot with respect to claims 6 and 8.

Claim 6 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. In particular, the Examiner alleged that claim 6 is indefinite because it appears to recite limitations that contradict limitations already recited in claim 1.

Applicants have cancelled claim 6, thereby rendering the rejection of claim 6 moot.

Claims 1, 4-8, 10-21, 25, 27, and 28 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Japanese patent no. 11-289296 A (Onaka, which is equivalent to U.S. Patent No. 6,351,323 B1, according to the Examiner) in view of U.S. Patent No. 4,945,531 A (Suzuki) and U.S. Patent No. 6,594,410 B2 (Kersey).

Onaka discloses that, "the AOTF 10 not only drops an optical signal having a predetermined wavelength, but also adds an optical signal having the same wavelength as the dropped signal, because the AOFT 10 has the function of dropping an optical signal having a certain wavelength and simultaneous adding an optical signal having the same wavelength as the dropped signal." See col. 8, lines 10-16.

Onaka discloses that, "Additionally, an AOTF 13 is provided as a wavelength selection filter, and an optical signal having each wavelength is transmitted to an electric ADM (optical signal receiver) 17." See col. 8, lines 6-9.

Suzuki discloses that, "The optical filter 100 functions to remove spontaneous emission noise from the amplified WDM signal. The optical filter 100 includes an optical demultiplexer 101 for demultiplexing the four optical signals having wavelengths substantially equal to the wavelength λ_1 , λ_2 , λ_3 and λ_4 from the WDM signal again. Thus, the optical filter 100 can selectively pass through only the optical signals having spectra of substantially λ_1 , λ_2 , λ_3 and λ_4 ." See col. 2, lines 47-56.

Kersey discloses:

The filter function 47 of one of grating (i.e., 44) comprises a relatively broad wavelength band having a generally rectangular profile, centered about reflection wavelength λ_A . The filter function 48 of the other grating (i.e., 44') comprises a relatively broad wavelength band having a generally rectangular profile, centered about reflection wavelength λ_B , which is offset from wavelength λ_A . The offset is such that a desired portion of the filter function 47', 48' overlap." in col. 16, lines 7-17.

According to claim 1 of the present invention,

an optical wavelength selecting filter optically connected to said tunable wavelength selecting element for removing noise present in any bands other than a signal band of each optical signal passing through said tunable wavelength selecting element; said wavelength selecting filter comprises an optical demultiplexer having an input port for inputting WDM signal light output from said tunable wavelength selecting element and N output ports for respectively outputting said N optical signals separated from said WDM signal light, and an optical multiplexer having N input ports for respectively inputting N optical signals output from said demultiplexer, and an output port for outputting WDM signal light obtained by wavelength division multiplexing said N optical signals input to said N input port; said transmission band of said optical demultiplexer per wavelength channel has a central wavelength substantially coinciding with a first wavelength shorter than the central wavelength of each wavelength channel of said WDM signal light and a fourth wording said transmission band of said optical multiplexer per wavelength channel has a central wavelength substantially coinciding with a second wavelength longer than the central wavelength of each wavelength channel of said WDM signal light

The first phrase in the body of claim 1, that is, the first phrase regarding, "an optical wavelength selecting filter optically connected to said tunable wavelength selecting element. . .," means that the optical wavelength selecting filter is optically connected to an output optical signal which is passed through by the tunable wavelength selecting element because the optical

wavelength selecting filter removes noise present in any bands other than a signal band of each optical signal passing through said tunable wavelength selecting element.

In light of the features of the present invention identified above, the noise component present near the central wavelength of each optical signal as shown in the spectrum-14 in FIG. 8 can be suppressed by preliminarily shifting the central wavelength of each AGW, thus in a WDM optical ring network, thus effectively preventing the oscillation of optical power in a WDM optical ring network even if the case that each of the optical demultiplexer and the optical multiplexer is provided by an AWG having a characteristic such that the transmission band per wavelength channel is wider than the signal band. See page 28, lines 4-13 of the specification.

However, the AOTF 13 of Onaka is provided for dropping an optical signal and is not provided for removing noise present in any bands other than a signal band of each optical signal passing through the AOTF 10.

Accordingly, *Onaka* fails to disclose or suggest the feature of the present invention identified by the first phrase in the body of claim 1.

Onaka also fails to disclose or suggest the AOTF 13 comprising an optical demultiplexer and an optical multiplexer. That is, *Onaka* fails to disclose or suggest the second phrase in the body of claim 1. Rather, *Onaka* discloses that, "if the selected band of the AOTF 10 is set off, then the ASE is added outside the band of the though optical signal." in col. 8, lines 58-60.

Moreover, *Onaka* fails to disclose or suggest removing ASE, which is contained in an optical signal passing through the AOTF 10 by using an optical demultiplexer and a multiplexer.

Therefore, claim 1 is patentable over *Onaka*, as *Onaka* fails to disclose or suggest the features of the present invention identified by the above claim language quote.

Suzuki adds no relevant information to *Onaka*, as the optical filter 100 in *Suzuki* is connected to an optical amplifier, and is not connected to a tunable wavelength-selecting element.

Accordingly, *Suzuki* also fails to disclose or suggest the feature of the present invention identified by the first phrase in the body of claim 1. *Suzuki* also fails to disclose or suggest that a transmission band of the optical demultiplexer 101 per wavelength channel has a central wavelength substantially coinciding with a first wavelength shorter than the central wavelength of each wavelength channel of the WDM signal light and a transmission band of the optical multiplexer 102 per wavelength channel has a central wavelength substantially coinciding with a

second wavelength longer than the central wavelength of each wavelength channel of the WDM signal light, that is, the feature identified by the third phrase in the body of claim 1.

Accordingly, if the case that each of the optical demultiplexer 101 and the optical multiplexer 102 is provided by an AWG having a characteristic such that the transmission band per wavelength channel is wider than the signal band, the optical fiber 100 can not suppress ASE.

Applicants respectfully submit that Kersey does not add any relevant information to the combination of cited references. In Kersey, the grating 44 is different from an optical demultiplexer and the grating 44' is different from an optical multiplexer. Further, the gratings 44 and 44' are filters of the same kind.

That is, Kersey only discloses combination of filters of the same type for obtaining a filter having a narrow wavelength band, but Kersey fails to disclose an optical wavelength selecting filter comprising an optical demultiplexer and an optical multiplexer. Accordingly, Kersey fails to disclose the feature of the present invention identified by the first and second phrases of claim 1.

Applicants respectfully submit that Onaka, Suzuki and Kersey, alone or in combination, fail to disclose or suggest removing ASE which is contained in an optical signal passing through an AOTF by using an demultiplexer and an optical multiplexer. Accordingly, Onaka, Suzuki and Kersey fail to disclose the features of the present invention identified by the first and second phrases in the body of claim 1.

Further, Onaka, Suzuki and, Kersey fail to disclose or suggest the case that each of the optical demultiplexer and the optical multiplexer is provided by an AWG having a characteristic such that the transmission band per wavelength channel is wider than the signal band.

Accordingly, Onaka, Suzuki and Kersey fail to disclose or suggest the features of the present invention identified by the third and fourth phrases of independent claim 1. Applicants further submit that one of ordinary skill in the relevant art would not be motivated to modify or combine the references Onaka, Suzuki and Kersey to arrive at the features of the present invention identified by the first, second, third and fourth phrases of claim 1.

As independent claim 15 recites language similar to that of independent claim 1, claim 15 is patentable over the features for at least the reasons submitted for independent claim 1. As dependent claims 4, 5, 7, 9-14 and 16-19 depend from independent claims 1 and 15, respectively, the dependent claims are patentable over the references for at least the reasons presented for the independent claims.

Claim 30 includes the same features of the present invention identified by the second, third and fourth phrases of claim 1. Therefore, claim 30 is not rendered obvious over Osaka in view of Suzuki and Kersey.

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

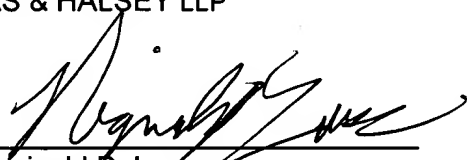
Respectfully submitted,

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11/17/06

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